

# Quality Control and Performance Appraisal

VOLUME THREE

A CONTEMPORARY NURSING RESOURCE BOOK...

A reader consisting of eight articles  
especially selected by  
The Journal of Nursing Administration  
Editorial Staff



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**Quality Control and  
Performance Appraisal  
Volume III**

*TABLE OF CONTENTS*

- 
- |    |   |
|----|---|
| 1  | Nursing Professional Review<br><i>Sue Thomas Hegyvary and R.K. Dieter Haussmann</i>   |
| 6  | The Relationship of Nursing Process and Patient Outcomes<br><i>Sue Thomas Hegyvary and R.K. Dieter Haussmann</i>  |
| 10 | Correlates of the Quality of Nursing Care<br><i>Sue Thomas Hegyvary and R.K. Dieter Haussmann</i>   |
| 16 | Criteria, Standards, Norms—Crucial Terms in Quality Assurance<br><i>Doris Bloch</i>   |
| 27 | Let's Ask the Patient: Consumer Input Can Improve Patient Care<br><i>Karin T. Kirchhoff</i>   |
| 32 | Pathway to Accountability: Implementation of a Quality Assurance Program<br><i>Geraldene Felton, Elaine Frevert, Kathleen Galligan, Mary Kathleen Neill, and Lillian Williams</i> |
| 37 | Developing a Measure of the Quality of Nursing Care<br><i>Edwin L. Weinstein</i>  |
| 40 | Developing Criterion Measures of Nursing Care: Case Study of a Process<br><i>Jacqueline F. Clinton, Mary Jean Denyes, Judy Ozbolt Goodwin, and Edwina M. Koto</i>                 |
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# Nursing Professional Review

by Sue Thomas Hegyvary  
and R.K. Dieter Haussmann

*A national system of medical peer review is in effect and it is likely that peer review for nonphysician health care professionals will follow. The authors propose a framework for developing and putting into operation a system of nursing professional review and discuss the issues and problems related to this process.*

The authors are grateful for the critical review and helpful suggestions provided by Dr. Susan Gortner. Dr. Gortner is project officer for the contract under which this paper was developed. This paper was prepared under contract N01-NU-24299 with the Division of Nursing, BHRD, HRA.

Public Law 92-603 passed on October 30, 1972, provides for the establishment of a national system of medical peer review, conducted by regionally based Professional Standards Review Organizations (PSROs). Under Phase I and II of a contract with the Division of Nursing, Bureau of Health Resources Development, Rush-Presbyterian-St. Luke's Medical Center and the Medicus Systems Corporation have recently developed and tested a process instrument for monitoring the quality of nursing care[1, 2]. As Phase III of this research, the contractors are seeking to adapt this instrument for concurrent review of nursing care in a manner consistent with the approaches taken for physician review under PSROs. The contractors wish to accomplish three goals:

1. To determine an appropriate framework for professional review in nursing;
2. To determine how the process instrument may be adapted to provide a tool for nursing review; and
3. To determine the effectiveness of the tool developed through pilot testing in an acute care institution involved in physician PSRO.

This paper will discuss factors which are related to the development of a model for nursing professional review. First, the projected operation of physician PSROs will be discussed since nursing professional review is expected to parallel and supplement it. Second, some difficulties in application of the current physician review mechanism to nursing will be discussed. Third, a conceptual framework for nursing professional review will be presented and analyzed. Finally, the proposed framework will be operationalized, and the proposed pilot testing described.

## PHYSICIAN PERFORMANCE REVIEW

According to Public Law 92-603 professional standards review of physician services was to be operationalized by January, 1976. It provides ongoing review of health care services delivered under Medicare, Medicaid, and maternal and child health programs. Defined tasks include admission certification, continued stay review, and medical care evaluation studies. The first two requirements are concerned with proper utilization of hospitals and alternative facilities. Medical care evaluation involves the analysis of patient care to determine the quality of medical care provided.

The Joint Commission on Accreditation of Hospitals (JCAH) also requires peer review in hospitals accredited after July 1, 1975. Unlike PSRO, this requirement applies to *all* hospitals and practices, not just Medicare and Medicaid patients. Many health care institutions are likely to satisfy PSRO and JCAH medical care evaluation requirements with the Performance Evaluation Procedure (PEP) developed by JCAH.

The approaches of PSRO and PEP have many similarities. They each utilize retrospective analyses. Further, they assume that the best measure of medical care provided is the patient outcome. The PEP Manual states: "The JCAH's Performance Evaluation Procedure does offer a methodology that can be used to effectively assess the quality of patient care on the basis of patient outcome data and retrospective chart review"[3]. The use of retrospective data in such evaluation studies, a common approach, assumes that the medical record provides adequate information to assess outcome achievement. By the application of these approaches, individual physicians will be held accountable for their activities.

Because the intent of Public Law 92-603 is to "promote effective, efficient and economical delivery of Medicare and Medicaid health services,"[4] it is likely that peer review for nonphysician health care professionals, already required by the law, will be operationalized in the not too distant future. Section 730 of the *PSRO Program Manual* specifies that non-physician health care practitioners engage in professional review similar to that required of physicians[5]. As more and more professionals become involved in review, it is imperative that comprehensive analyses of the overall quality of health care be conducted. To this end, professional review for non-physicians should be compatible with performance review for physicians.

#### ISSUES AND PROBLEMS IN NURSING PERFORMANCE REVIEW

The mechanism established in PSRO and under PEP raise some issues and questions in regard to nursing performance review. As stated above, current methodologies (a) utilize retrospective review, (b) are based on patient outcomes, and (c) assess the quality of practice of the individual physician. When each of these is applied to nursing review certain problems arise.

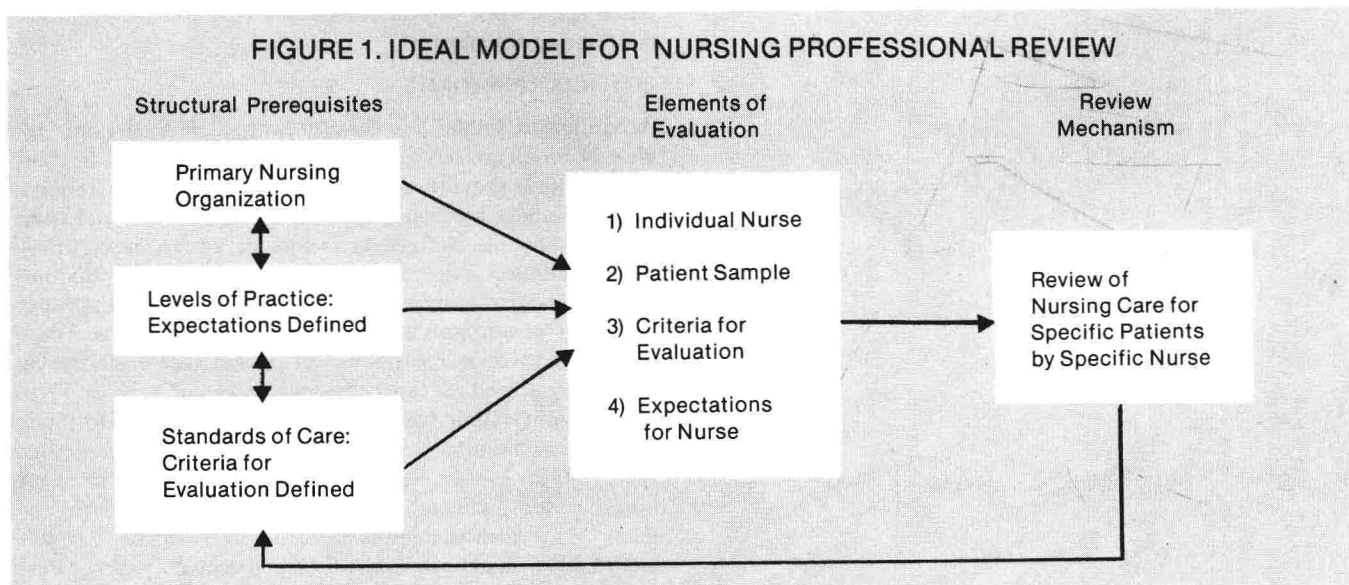
Retrospective chart review has been used extensively in many auditing procedures. The obvious difficulty with this method is the validity of the data because of the limited infor-

mation available in the record. While records provide much useful data, many types of information have been shown to be quite lacking there, relevant to both process and outcomes of care. The areas of health knowledge and psychological aspects of care present particular difficulties. Several studies have questioned the feasibility of retrospective chart review as a basis for quality assessment[6,7,8]. In contrast, concurrent assessment provides an acceptable level of validity and greater latitude to utilize other sources of information such as the patient interview.

The focus on patient outcomes has gained wide acceptance because of the necessity of documenting the effectiveness of care. Both the PSRO and PEP methods evaluate patient outcomes to determine the effectiveness of the care provided. PEP then recommends a process analysis to determine the reasons for unsatisfactory outcomes. Applied to nursing, this focus requires identification of patient outcomes that are influenced by nursing care. But, given the complexity of the patient care system, there are numerous variables that influence patient care outcomes. The performance of individual health professionals may have an impact, but rarely can individual performance be considered the sole determinant of outcomes. Studies have demonstrated a lack of certainty and predictability in the relationship between processes and outcomes of care for different professional provider groups[9,10]. Thus, further research is necessary in relation to specification of appropriate outcomes, and to the individual and group performance of health professionals leading to specific outcomes. A complicating problem with outcomes assessment in nursing is that much of nursing focuses on psychosocial problems, such as adaptation to illness. This leads to significant measurement problems[11] since results of such activities may not be readily apparent, and measures must relate to changes in behavior and level of understanding.

Perhaps the greatest difficulty in applying procedures for physician professional review to nursing is the general lack of individual professional accountability for specific patient care. Such accountability exists only with primary nursing, which is not yet very widespread in its application. The large

FIGURE 1. IDEAL MODEL FOR NURSING PROFESSIONAL REVIEW





majority of nursing services are provided in team or functional organizational arrangements. Thus, a nursing performance review system must take into account the usual lack of ability to identify an individual nurse as the focus of the review. Performance review may be a strong incentive for wider use of primary nursing since it provides a greater degree of individual professional responsibility and accountability.

Further, responsibilities of individual nurses may differ significantly. If individual nurse performance review were attempted, it would be necessary to consider the expected behaviors of the nurse in relation to care of a set of patients. This problem exists in all types of nursing care organization.

There are, then, several difficulties in applying physician professional review approaches to nursing performance review. These problems and issues provide a basis for describing a model or ideal system for nursing professional review.

### The Ideal System

The ideal system of nursing professional review would parallel physician professional review so that a composite picture of health care quality within a PSRO could be provided. Such a system is purely theoretical because the circumstances under which it might be actualized do not yet exist. However, it can be described as an accountability model toward which the nursing profession is moving.

Certain structural prerequisites would be necessary within the accountability system. As shown in Figure 1, the nursing care organization within this model would be primary nursing. Only within such an organization can individual nurses be held accountable for their activities.

Within the ideal system, clinical expectations are further delineated in terms of standards of care for various types of patients. Criteria to be used in performance evaluation are based on these standards. In this way, the quality of care is measured against a known professional standard, and is, thus, less likely to be subjectively determined.

A further refinement in the accountability system is the delineation of expected clinical behaviors in terms of different levels of practice. Individual nurses may thus be evaluated

against norms which are consistent with their level of experience and clinical skill. The inclusion of levels of practice ensures that a recently graduated clinician is not expected to practice and be reviewed against the same level of performance as a clinical specialist with many years of experience.

### The State of Nursing Practice

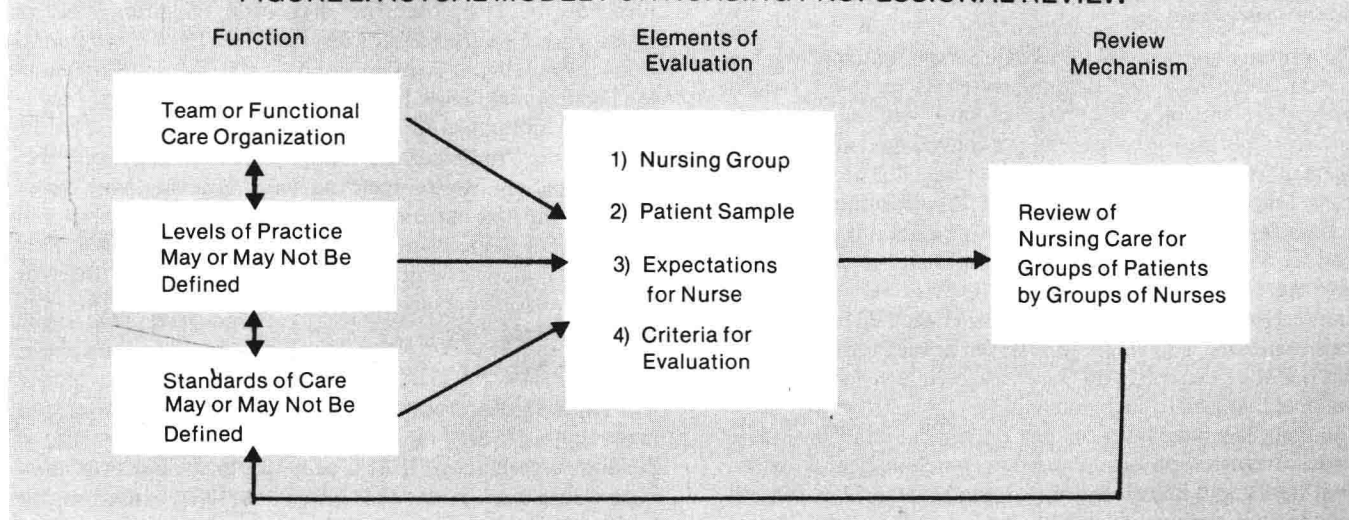
The actual system of nursing practice deviates considerably from the ideal described. Most nursing groups practice with none of the organizational prerequisites. A few possess one or the other, for example, primary nursing, differential levels of practice or explicit standards of care used for the ideal system. To account for these actualities, nursing professional reviews will necessarily have somewhat different objectives and will operate differently than physician review.

First, the present structure of most nursing service organizations allows accountability for care to be vested only at the level of the nursing group. Thus, the performance of the nursing group rather than the performance of the individual nurse is reflected in the results of nursing professional review. Second, nursing service organizations which do not make use of different levels of practice have only one level (or expectation) against which to measure nursing performance. The level of practice chosen (and associated expectation) then becomes a problem. Finally, without standards of care, criteria which accurately reflect expectations of nurses are difficult to define. Figure 2 depicts the interrelationship and impact of these deviations from the ideal on nursing professional review. The objective for nursing professional review, then, is to develop a model based on the ideal system with modifications that take into consideration the current state of practice.

### PROPOSED CONCEPTUAL FRAMEWORK

As in medical care review, it appears that assessment of nursing care should focus on patient outcomes in the pilot study. To the extent that outcomes are acceptable, nursing care is considered to be appropriate; and, given unfavorable patient outcomes, nursing care requires careful review to determine whether it was responsible. A major complication with this

FIGURE 2. ACTUAL MODEL FOR NURSING PROFESSIONAL REVIEW



basic premise as noted earlier, is the fact that the effects of nursing care on patient outcomes are often difficult to separate from the effects of the patient's total care program; this difficulty is further compounded by the measurement problems inherent in the nonphysical, psychosocial realm into which much of nursing activity falls.

Nursing professional review, then, necessarily examines the sum total of nursing care delivered in a specific setting by a group of nurses[12]. It does so with the assumptions that 1) nursing care affects the outcome of the patient's illness and influences his future health status; and 2) even though nursing shares responsibility for patient care with many health disciplines, identifiable outcomes exist that are primarily attributable to nursing care.

If criteria for measuring the results or outcomes of care existed and had been tested, then nursing professional review could be developed around these much as medical care review is being developed in PSROs. Unfortunately, there have been few studies conducted in this area and no data base exists which would allow identification of the consequences of even standard nursing practices. Hence, any system for nursing professional review must go beyond review of outcomes to provide for assessment of practice and of the relationship of practice to outcomes. This relationship must be studied not only in situations of questionable outcomes, but also in cases where satisfactory and even outstanding outcomes are obtained. If a system for nursing professional review does not possess such capability, it cannot achieve its primary purpose—improvement in nursing outcomes through education of practitioners.

Given these philosophical foundations, a system for nursing professional review is proposed which provides for:

1. *Screening of selected patient outcomes* to identify both poor and excellent consequences of nursing care;
2. *Systematic monitoring of nursing practice* focused specifically on those nursing interventions expected to affect key patient outcomes; and
3. *Evaluation studies to analyze* the relationship of nursing practice and patient outcomes.

Each of these elements of the proposed system is reviewed further in the following sections.

#### **The Outcomes Screen**

The primary purpose of screening patient outcomes in the context of nursing professional review is to identify those cases where nursing care appears to have been inadequate. A secondary purpose is to identify the converse situation—cases where unexpectedly good results are obtained. These purposes imply that outcomes to be screened should result primarily from independent nursing judgment and actions. Outcomes that are the result of dependent, coordinative, or collaborative nursing activities cannot be ignored in an outcome screen. However, it must be recognized that variation unrelated to nursing is likely to be observed in such outcomes, and that it will be extremely difficult to ascertain specific nursing practices that lead to such outcomes.

Patient care outcomes for any patient may fall into these broad categories: physical condition, psychological or attitudinal status, and knowledge or learning behavior. Specific criteria for determining attainment of outcomes in these areas

are now being defined by nurses for a variety of patient populations[13–16]. The American Nurses' Association is engaged in a major project to develop methodologies for establishing such criteria specifically for the purpose of screening nursing care as part of PSRO review.

Such definition requires an understanding of the point at which outcomes should be assessed. Three periods of time might be considered: during hospitalization, at discharge, or postdischarge. Selected outcomes may be identifiable during hospitalization, for example, the effectiveness of preoperative teaching on postoperative recovery might be at least partly assessable on the third or fourth postoperative day. However, the majority of nursing care outcomes may not be evident until discharge or thereafter. Outcomes assessment after discharge, however, is not only difficult (because of the need to teach patients) and costly; but it also raises the question of the limits of institutional impact since many confounding influences not under the control of the institution can affect patient status after discharge.

Reviews just prior to discharge have the advantage of permitting a chart audit, the traditional review mechanism, that is supplemented by interviewing and observing the patient. This method is particularly important in nursing where patient records typically do not present a full picture of patient status. A specific difficulty can exist, however, with outcomes assessment at discharge. For some patients and conditions (particularly chronic ailments), outcomes will be assessable only in terms of "change in status" achieved rather than against some more absolute standard. In such cases, assessment of outcomes at discharge without specific reference to patient status on admission would be unrealistic and would not yield outcome data that could be meaningfully related to nursing practice.

Specific objectives of care within each of the three broad categories (physical condition, psychological status, and health knowledge) and criteria for assessing progress toward those objectives require a definition of the population to which they are to apply. A patient population in this context is a group of patients with similar nursing care problems occurring in sufficient number to justify review. A number of frameworks can be used to classify populations such as developmental stages of life, concepts (e.g., rehabilitation), major problems or symptoms, or diagnostic conditions. While classification on the basis of disease entity has known limitations for nursing, it is an appropriate starting point for nursing professional review because it represents the current focus of PSRO and utilization review activities and because of the eventual need to tie nursing and physician review together to permit "patient care review." As screening criteria are developed for nursing outcomes of specific disease categories and experience is gained with nursing professional review it may well be that many disease entities are more alike than different from the nursing perspective so that they may more efficiently be reviewed together.

#### **Monitoring Nursing Practice**

The Rush-Medicus quality monitoring instrument developed in previous phases of this project provides a detailed profile of nursing performance[17]. It is proposed as the basis for nursing practice assessment. This instrument relies extensively on both record review and patient interview, and, using the prin-



ciples of statistics, reviews the nursing process taking place for a given group of patients over a defined period of time from a random sample of the group.

Since the intent of process monitoring in this context is to permit study of the relationship of process and outcomes of nursing care, the process instrument will require adaptation to each of the specific populations for which outcome screens are developed. The criteria are currently coded by intensity of illness; for use jointly with outcomes screens, they will be further coded according to specific patient populations to which they apply. This adaptation provides identification of dimensions and criteria through the scope of the nursing process that are predicted to be particularly relevant to the desired outcomes of each of the patient populations. The instrument will not be modified to such an extent that its basic validity and reliability is not maintained.

### Evaluation Studies

In the proposed review system, the modified process monitoring instrument will be applied to a random sample of each patient population which is screened for outcomes at discharge. Analysis of findings will then proceed as follows:

1. Outcome profiles are prepared routinely for all populations studied. These profiles may be developed for specific nursing care units or individual practitioners—if the accountability system permits and a sufficient sample is available. (Profiles of nursing care may also be utilized by physicians to study the relationship between nursing and medical care outcomes.)
2. For selected outcomes, nursing practice profiles are prepared for those patients for which outcomes fall outside an "acceptable" range. These profiles may then be studied to identify differences in practice patterns that may correlate with the different outcomes that were achieved. Such analyses cannot be carried out until outcomes for a significant number of patients have been screened, and practice patterns for subgroups of these populations can be established.

To maximize the ability to isolate key relationships between nursing practice and outcomes, a variety of possible explanatory variables in this relationship, for example, physician, patient age, sex, race, etc., will have to be taken into account. This will require additional data collection as part of the review process.

### PROFESSIONAL REVIEW IN OPERATION

Within the general framework outlined above, nursing professional review would operate as follows:

1. *Outcomes Screening.* A nurse coordinator would screen all patients of the populations of interest 24 hours prior to discharge against a specific set of outcomes criteria. Initially, suggested populations are myocardial infarction, cholecystectomy, abdominal hysterectomy, transurethral resection, colostomy, and normal newborns. Outcomes criteria for these populations have been or are being developed by various nursing groups. These criteria will serve as indicators of dimensions in which nursing effects should be achieved. They will not serve as absolute standards.

2. *Practice Monitoring.* A number of nurse observers, preferably drawn from within an institution's nursing service, would utilize the modified process instrument to monitor on a sample basis all patients within the designated diagnostic categories. Frequency of sampling will be dependent on the expected number of admissions in each category and the time period for which profiles are desired.

3. *Evaluation Studies.* Outcome profiles should be developed periodically for review by a nursing audit committee. These profiles will reflect the degree of achievement of outcomes, and should thus provide feedback to nursing practitioners and management regarding the effects of nursing practice. Decisions regarding which outcomes need to be further studied in terms of practice patterns should be made for an institution or PSRO by this review group. The committee may also decide to review certain nursing outcomes jointly with medical care outcomes for a specified group of physicians and nurses. The result of these evaluation studies should be a critical reassessment of the outcomes criteria to ascertain their usefulness in managing nursing practice.

### SUMMARY

This paper presents an overview of a project to develop a system of nursing professional review. The proposed strategy has been tested and a report is forthcoming.

### REFERENCES

1. Haussmann, R.K.D., et al. *Quality of Nursing Care: Assessment and Correlates*. Washington, D.C.: Government Printing Office, 1976.
2. Jelinek, R.C. A methodology for monitoring quality of nursing care. No. 75-24, Dept. of Health, Education and Welfare, Health Resources Administration, Washington, D.C., 1974.
3. Christoffel, T. and Jacobs, C. *The PEP Primer*. Chicago: Quality Review Center, Joint Commission on Accreditation of Hospitals, 1974, p. 34.
4. U.S. Public Law 92-603, 92nd Congress, 2nd Session, 1972.
5. Department of Health, Education and Welfare. *P.S.R.O. Program Manual*. Office of Professional Standards Review, 1975.
6. Haussmann, R.K.D. et al. 1976.
7. Fessel, W.J., and Van Brunt, E.E. Assessing quality of care from the medical record. *N. Engl. J. Med.*, Vol. 286, No. 3, 1972, pp. 134-138.
8. De Geyndt, W. Five approaches for assessing the quality of care. *Hosp. Admin.*, Vol. 15, No. 21, 1970, p. 42.
9. Haussmann, R.K.D. et al. 1976.
10. Brook, R.H. Quality of care assessment: a comparison of five methods of peer review. No. 74-3100, Dept. of Health, Education and Welfare, Health Resource Administration, Washington, D.C., 1973, pp. 57-59.
11. Bloch, D. Evaluation of nursing care in terms of process and outcome. *Nurs. Res.*, Vol. 24, No. 4, 1975, pp. 256-263.
12. American Nurses' Association. *American Nurses' Association Guidelines for the Formation of Peer Review Committees*. 1974.
13. Taylor, J.W. Measuring the outcomes of nursing care. *Nurs. Clin. North Am.*, Vol. 9, No. 2, 1974, pp. 337-348.
14. Haussmann, R.K.D. et al. 1976.
15. Anderson, M.I. Development of outcome criteria for the patient with congestive heart failure. *Nurs. Clin. North Am.*, Vol. 9, No. 2, pp. 349-358.
16. Hilger, E.E. Developing nursing outcome criteria. *Nurs. Clin. North Am.*, Vol. 9, No. 2, 1974, pp. 323-330.
17. Haussmann, R.K.D. et al. 1976.

# The Relationship of Nursing Process and Patient Outcomes

by Sue Thomas Hegyvary  
and R.K. Dieter Haussmann

*Reprinted from JONA, November, 1976.*

*Aspects of the nursing process were monitored and were related statistically to patient outcomes in three dimensions predicted to be related to nursing care: physical condition, psychological status, and health knowledge. Some outcomes correlated with care; others did not. The inconsistent relationships indicated a need for continued assessment of both process and outcomes for nursing.*

The study reported in this paper was supported by the Division of Nursing, BHRD, HRA under Contract NOI-NU-2499.

Focus on patient outcomes in the assessment on health care services has gained wide acceptance because of the need to document the effectiveness of care. Both the PSRO law and JCAH now require evaluation of the effectiveness of the care provided. Applied to nursing, this focus requires identification of patient outcomes that are influenced by nursing care. Outcome assessment in nursing is complicated by the fact that much of nursing is directed toward psychosocial problems, an area in which there are significant measurement difficulties.

Patient care outcomes can be measured along three broad lines: physical condition, psychological or attitudinal status, and knowledge or learning behavior. Specific criteria for determining outcomes in these areas are now being defined by nurses for a variety of patient populations[1-3]. The ANA has just concluded a major project to develop methodologies for establishing such criteria.

All of these efforts are proceeding on the assumptions that 1) nursing care affects the outcome of the patient's illness and influences his future health status; and 2) even though nursing shares responsibility for patient care with many health disciplines, there exist identifiable outcomes that are primarily attributable to nursing care. Unfortunately, there have been few studies conducted in this area and no data base exists which would allow identification of the consequences of even standard nursing practices. Hegyvary did find that care outcomes of patients undergoing abdominal hysterectomy differed in two hospitals[4]. The data strongly suggested, but did not document in specific terms, that nursing care before and after the operation differed between hospitals. Unfortunately, the lack of inclusion of specific measures of nursing performance (i.e., process) prohibited formulation of conclusions regard-

ing process-outcome relationships. Without understanding this relationship, the meaning and usefulness of patient outcome measures is doubtful.

This study attempted to explore some of the problems involved in addressing the process-outcome relationship for nursing care. It was conducted in the context of a larger study focusing on the development and testing of a process evaluation instrument for nursing care, and is thus only a very limited effort to begin to understand the problems outlined above[5].

## STUDY DESIGN

Considerations in selecting patient populations were: 1) the groups chosen should have illnesses for which specific outcomes could be delineated; 2) the outcomes could be predicted to relate to nursing care; and 3) adequate patient samples would be accessible in two local hospitals in which process monitoring was taking place as part of the larger study. Based on these considerations, patients with congestive heart failure (CHF) and patients undergoing abdominal hysterectomy (AH) were selected.

Patients with CHF were included in the study if they had been in the hospital for at least six days, if they were out of the acute stage of illness, and if they had no known pathological involvement beyond cardiovascular and respiratory systems. Patients were chosen with reference to the American Heart Association Functional Classifications of Patients with Diseases of the Heart[6]. On admission they were class IV, i.e., in an acute stage of illness. They were interviewed six days after admission, when they were generally comfortable and subject only to slight limitations of physical activity, i.e., class II.

The abdominal hysterectomy sample was observed six days postoperatively. Patients were not included in the sample if there was any additional pathological involvement that appeared likely to alter the postoperative course.

These specifications permitted clearer delineation of outcome measures because the degree of pathological involvement was controlled, but they also presented great difficulties in securing an adequate sample within a reasonable period. Particular difficulty was encountered with patients with congestive heart failure. Numerous patients had multiple diseases in addition to the cardiopulmonary illness. The intensity of illness and the anticipated period of resolution of congestive failure are not so clear cut as classification may suggest. Thus, the CHF sample contained only ten patients, all from the same hospital, and the AH sample numbered 18 patients, ten from one hospital and eight from the other, selected over a data collection period of three months.

To test the relationship between nursing process and patient outcomes, it was necessary to develop both process and outcomes instruments for each patient category. A subset of the nursing process criteria that had been developed for the total process evaluation instrument was selected to administer to each type of patient. (The instrument is described in "Monitoring Nursing Care Quality" which is published in this issue.) The criteria were selected to cover the scope of the nursing process and to be of particular relevance to CHF and AH patients, respectively. Thirty-eight criteria were selected for CHF patients, and 24 for patients undergoing abdominal hysterectomy.



TABLE 1. OUTCOME ASSESSMENT CRITERIA CHF PATIENTS

Physical Condition			Health Knowledge		
Items refer to three objectives: (1) maintenance of adequate oxygenation; (2) maintenance of skin integrity; and (3) maintenance of adequate rest and sleep.			Items refer to patient's understanding of (1) illness, (2) measures to maintain oxygenation, (3) measures to maintain skin integrity, (4) measures to improve rest and sleep, (5) fluid and nutritional status, and (6) medication.		
Item	Response		Item	Response	
1. Temp. 100.4 or more in past 24 hours.	No	0	1. Can you tell me the name of your illness?	0	Unacceptable
	Yes	1		1	Acceptable
2. Have any episodes of orthopnea been recorded in the past 48 hours? (If #2 was answered "Yes" response, do not ask #3; code 0.)	No	0	2. How can you change your position in bed to help you breathe more easily?	0	
	Yes	1		1	
3. If nothing recorded for #2, ask the patient: Is it more difficult for you to breathe when you are lying down than when you are sitting up?	No	0	3. What can you do to relieve congestion in your lungs?	0	
	Yes	1		1	
4. Is the patient's skin cracked due to dryness? (Observe extremities.)	No	0	4. What can you do to improve the circulation to your feet?	0	
	Yes	1		1	
5. Does the patient have any skin lesions, burns or abrasions at pressure points or on the extremities?	No	0	5. What type of diet are you on?	0	
	Yes	1		1	
6. According to the record has the patient become fatigued when performing daily activities in the past 2 days? (If answer was "Yes" to #6, code 0 for #7; do not ask.)	No	0	6. Do you know what types of food, if any, you should not eat because of your condition?	0	
	Yes	1		1	
7. If nothing has been recorded for #6 ask the patient: Are you able to do your daily activities such as getting dressed, eating or going to the bathroom without getting tired?	No	0	7. What is the reason for restricting any foods?	0	
	Yes	1		1	
8. Inability to sleep (To Patient: For the past 2 nights, have you had difficulty sleeping at least several hours at a time?)	No	0	8. Can you tell me the names of medications you are taking while you are in the hospital?	0	
	Yes	1		1	Don't know
					NA
			9. What is the dose? (Digitalis preparation or diuretic, in order of preference)	0	
				1	Don't know
					NA
			10. How often will you take this medication?	0	
				1	Don't know
					NA
			11. What precautions, if any, should you observe because you take this medication? (Clarify: Are there any special things you should do because you take this medication?)	0	
				1	Don't know
					NA

TABLE 2. OUTCOME ASSESSMENT CRITERIA AH PATIENTS

Physical Condition		Health Knowledge	
Items refer to (1) prevention of complications and (2) return of normal gastrointestinal function.		Items refer to understanding of (1) illness and (2) activity, including sexual activity.	
Item		Item	
1. Number of postoperative days temperature was 100.4F. or higher.		1. Diagnosis	
2. Number of the postoperative day on which patient returned to solid diet.		(To Patient: Can you tell me the name of the condition you had that made it necessary for you to have your operation?)	
3. Total number of postoperative narcotics received.		2. Name of the operation	
4. Incidence of complications (Count 3 points for each complication recorded; e.g. debiscense or abscess, UTI, thrombophlebitis, respiratory congestion, wound infection, etc.)		(To Patient: Can you tell me the name of the operation you just had?)	
5. Number of days patient was bothered by gas pains. (To patient: Have you been bothered by gas pains since your operation? How many days have you had them?)		3. Understanding of operation, in simple terms.	
		(To Patient: Would you tell me basically what was done in this operation?)	
		4. Activity limits after discharge.	
		(To Patient: What will your activity limits be when you go home?)	
		5. Effect of operation on sexual activity.	
		(Continued from #4: Do you know if there will be other limitations, such as in sexual relations?)	

**TABLE 3. MEASURE OF  
PSYCHOLOGICAL STATUS  
(CHF AND AH PATIENTS)**

Modified Zuckerman Affect Adjective Check List  
Each adjective is typed on a separate card. Patient sorts cards into two stacks: (1) I do feel like this today, and (2) I do not feel like this today. Patient gets one point for each positive word answered positively and each negative word answered negatively. Range of scores is 0 to 19.

Adjective	Affect
1. Angry	-
2. Calm	+
3. Cheerful	+
4. Contented	+
5. Desperate	-
6. Depressed	-
7. Determined	+
8. Frightened	-
9. Happy	+
10. Nervous	-
11. Optimistic	+
12. Panicky	-
13. Secure	+
14. Shaky	-
15. Steady	+
16. Tense	-
17. Terrified	-
18. Upset	-
19. Worrying	-

Only immediate outcomes of care were measured, as a post-hospitalization study was not feasible. Measurement instruments were based partly on chart audit but also on patient interview and observation. Outcome criteria used are presented in Tables 1-3.

The instruments for measuring physical condition and level of health knowledge had not been previously tested. Thus, content validity is the highest level of validity achieved. The measure of psychological status had been tested previously. It

is a modified Affect Adjective Check List developed by Zuckerman, and was used in this study as a card sort for patient's self-report of psychological status[7].

Data collection was designed to maximize observer reliability. Achieving observer reliability required considerable clarification of each question, specification of the source of information, and clear response categories. Nevertheless, there was still lack of agreement on some items. The health knowledge category presented the greatest problem. Observers often found it difficult to determine what level of patient response comprised an acceptable answer. Information about physical condition derived from written records presented us with a lesser, though troublesome, problem with observer reliability.

The observer reliability problem was handled first by joint observation and interviewing. The three nurses selected for this task went together to the patient care unit, each with the same worksheet. As the record for each patient was reviewed, each observer completed her own worksheet without comparing notes with the others. The three then went to the patient's room, where one nurse conducted the interview while the other two listened. Finally, all responses were compared and points of disagreement were discussed.

This method was successful with the process criteria and with outcome criteria related to physical condition. (The measure of psychological status was not a problem because it was a card sort done by the patient.) Health knowledge measures continued to present some difficulties. The observers were generally aware of items on which there would be disagreement, based on their own difficulty in arriving at the answer. Thus, they decided that, when making the observation alone, they should record the patient's response *verbatim* if they felt the slightest uncertainty about the answer.

The question of observer reliability is one of crucial importance that has not been fully addressed in instrument development and testing in the health care evaluation field.

#### ANALYSIS AND FINDINGS

In the study of the relationship between the nursing process and patient care outcomes, the individual patient was the unit

**TABLE 4. CORRELATION OF NURSING PROCESS AND  
OUTCOMES IN ABDOMINAL HYSTERECTOMY**

NURSING PROCESS		PATIENT OUTCOMES (N = 18)		
		Physical Condition	Psychological Status	Health Knowledge
Assessing—Planning	R =	.277	-.36*	.145
	P =	.18	.07	.28
Physical Care	R =	.484*	.395*	.144
	P =	.02	.05	.28
Nonphysical Care	R =	.517*	.049	.310*
	P =	.01	.42	.11
Evaluation	R =	-.241	-.206	-.155
	P =	.17	.21	.27

The first figure in each cell is the simple correlation; the second figure indicates level of significance.

\*Significant at .10 level.



TABLE 5. CORRELATION OF NURSING PROCESS AND OUTCOMES IN CONGESTIVE HEART FAILURE

NURSING PROCESS		PATIENT OUTCOMES (N = 10)		
		Physical Condition	Psychological Status	Health Knowledge
Assessing—Planning	R =	-.049	-.051	.526*
	P =	.44	.44	.05
Physical Care	R =	-.463*	.101	-.186
	P =	.09	.39	.30
Nonphysical Care	R =	.249	.492*	.201
	P =	.24	.07	.29
Evaluation	R =	-.055	-.323	.573*
	P =	.44	.18	.04

The first figure in each cell is the simple correlation; the second figure indicates level of significance.

\*Significant at .10 level.

of analysis. The scores for each of the components of the nursing process methodology—Assessing—Planning, Physical Care, Nonphysical Care Evaluation—into which the process criteria were grouped, were correlated with the scores for each outcome category. The results are presented for the two patient groups in Tables 4 and 5.

In the abdominal hysterectomy sample the patient's physical condition correlated with the quality of direct care, both in regard to physical and nonphysical needs. Patient psychological status correlated with the assessing-planning and physical care components; however, contrary to expectation, it was not associated with nonphysical care, which includes psychological-emotional support. The level of health knowledge was correlated with nonphysical care, as predicted, since health teaching is part of that process objective. Most of these findings indicate that the nursing process and patient outcomes were related in a positive direction for this sample.

In the congestive heart failure sample, physical condition was inversely related to the physical care component of the nursing process. In view of the patient sample, this finding appears to indicate that the most severely ill patients were given more attention by the nursing staff. This finding could also indicate that outcomes were not appropriately specified in relation to the severity of illness. Further documentation is required to find a satisfactory explanation.

The psychological status of CHF patients was related to the quality of nonphysical care, as predicted. However, the level of health knowledge was not related to nonphysical care but to assessment-planning and to evaluation. This finding suggests a possible substitution effect in that assessing, planning, and evaluation require interaction with the patient. Perhaps the nurse's questions for purposes of problem identification and evaluation of the patient's response to therapy added to the health knowledge of the patient.

Although the number of cases was very limited, an attempt was made to determine whether scores differed in relation to the hospital setting. As previously indicated, the AH patients were located in two hospitals. The two hospitals were known to differ along a number of structural dimensions and also to have different overall quality scores. The results showed that

Hospital A had significantly lower quality scores in the areas of nonphysical care (psychological-emotional support, health teaching, etc.), and evaluation of care. There was a correspondingly significant difference in the level of health knowledge in the two sets of patients. However, there was no significant difference in psychological status, as was expected in view of the difference in process scores on nonphysical care. The inconsistency in the results suggest that there are probably factors related to the hospital setting that may confound the relationship between the nursing process and patient care outcomes.

#### CONCLUSION

These findings suggest that the relationship between the nursing process and patient care outcomes is somewhat inconsistent, and may differ with various types of patients. The focus on outcome assessment is supported, as in every type of outcome with both types of patients, some part of the nursing process showed a significant correlation. However, the data suggest that limiting quality assessment to either process or outcome measures may be inappropriate because of the inconsistency of the relationship and the lack of conclusive evidence regarding causes and effects.

#### REFERENCES

1. Taylor, J.W. Measuring the outcomes of nursing care. *Nurs. Clin. North Am.*, Vol. 9, No. 2, 1974, pp. 337-348.
2. Anderson, M.I. Development of outcome criteria for the patient with congestive heart failure. *Nurs. Clin. North Am.*, Vol. 9, No. 2, 1974, pp. 349-358.
3. Hilger, E. Developing nursing outcome criteria. *Nurs. Clin. North Am.*, Vol. 9, No. 2, 1974, pp. 323-330.
4. Hegyvary, S.T. "Organizational Setting and Patient Care Outcomes: An exploratory Study." Doctoral dissertation, Vanderbilt University, 1974.
5. Haussmann, R.K. Dieter, et al. *Monitoring Quality of Nursing Care, Part II: Assessment and Study of Correlates*. July, 1975. Washington, D.C.: DHEW Publ. HRA 76-7.
6. Anderson, M.I., 1974.
7. Zuckerman, M. The development of an affect adjective check list for the measurement of anxiety. *J. Consult. Psychol.*, Vol. 24, 1960, pp. 457-461.

# Correlates of the Quality of Nursing Care

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*Numerous variables influence the effectiveness of the nursing process. By identifying and documenting the complexity and interrelation of components of the patient care system, some priorities are delineated for the management of positive and negative determinants of quality outcomes.*

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There has been much speculation but little research on the variables that influence the quality of nursing care. Several problems have impeded the identification of such variables: 1) the lack of a valid, reliable measure of nursing quality; 2) the absence of a comparative analysis across a number of institutions; and 3) the failure to focus on more than a single variable with its attendant requirement of collecting quantities of often original data. The studies conducted by Rush-Presbyterian-St. Luke's Medical Center and the Medicus Systems Corporation provided an opportunity to overcome these difficulties and to explore the relationship of a wide range of variables with the quality of the nursing process[1-4].

## REVIEW OF RELEVANT LITERATURE

Numerous studies have been conducted in various types of organizations to investigate the influence of selected variables on the quality of work performance. Georgopoulos best described the framework for such research[5]. Consistent with modern open system theory, he viewed the hospital as a complex sociotechnical system capable of problem solving, of regulating itself internally, of restructuring parts without serious loss of continuity, and of adapting to changes in the external environment. Inputs included raw materials, supplies, equipment, funds, labor, personnel skills and attitudes, and structural characteristics of the setting. The primary output was the quality of care. Between the inputs and outputs were critical processes that typified the day-to-day activities of personnel, such as resource allocation and control, coordination of efforts, social and psychological integration, and management of organizational strain.

Several investigators have used this framework to document the relationship of specific organizational variables to performance and effectiveness. Neuhauser and Andersen reported that the quality of medical care, determined by physician ratings, was positively related to size, complexity and teaching status of the hospital[6]. They did not, however, investigate these variables in relation to the quality of nursing care. Georgopoulos found a strong, positive relationship between coordination and the quality of nursing care, but not

with medical care quality[7]. These findings suggest that nursing might be more susceptible than medical to organizational influences, and the two types of care merit individual review.

Other variables reported to be associated with nursing excellence include, staff satisfaction, leadership style, nurses' clinical orientation, and education[8-14]. Information from other settings suggest that many additional variables not previously examined in relation to quality may also influence performance. These include, job attitudes of both managerial and front-line staff, size of the work groups, extent of task specialization, and degree of human relations orientation[15-18].

Based on these and other related studies and hypotheses, 33 variables were defined for investigation. Jelinek's model of the patient care system established an initial framework for the hypothesized relationships between these variables and quality care[19].

## STUDY DESIGN

This investigation was conducted in 102 patient care units in 19 hospitals in various parts of the United States[20]. Sample hospitals differed along many dimensions; included were five university medical centers, three county, and 11 community hospitals. A total of 27 general medical, 30 general surgical, and ten mixed medical-surgical units in these hospitals comprised the data base for attitudes and perceptions of nursing staff.

The 33 independent variables selected for study were grouped into five general categories.

*Category 1: Contextual Variables* (total hospital characteristics—derived from the American Hospital Association's *Guide to the Health Care Field*, 1973)

1. Complexity: number of facilities and medical services;
2. Source of control: not-for-profit (nongovernment), church, state or county;
3. Number of beds;
4. Number of admissions per year;
5. Average occupancy;
6. Nursing school affiliation: NLN approved school within the institution;
7. Medical school affiliation: medical school within the institution;
8. Teaching status: AMA approved internship and residency program;
9. Location: inner city of large city, small city, other;



**TABLE 1. PERCENTAGE OF VARIANCE IN QUALITY SCORES  
EXPLAINED BY VARIABLES AND CATEGORIES**

Categories	Quality Components					
	Assessment & Planning	Physical Care	Nonphysical Care	Evaluation	Unit Procedures	Environmental & Support Services
Contextual Variables	34.8	41.8	50.0	31.5	41.6	31.2
Unit Organizational Structure	35.7	22.0	29.3	18.7	16.0	29.4
Staff Attitudes and Perceptions	32.6	30.6	29.0	39.0	43.2	44.2
Unit Organizational Structure Combined with Staff Attitudes and Perceptions	53.1	43.3	46.6	48.5	49.8	56.0
All Variables	55.6	55.9	62.8	52.0	57.6	66.0

10. Hospital type: medical center, community, or county hospital.

*Category 2: Unit Organizational Structure*  
(data reported by hospital project staff)

1. Number of beds;
2. Average census;
3. Average number of RN hours per patient day;
4. Average number of LPN hours per patient day;
5. Average number of nurse aide hours per patient day;
6. Type of nursing care organization: functional, team, primary;
7. Average workload;
8. Coordination of services;
9. Freedom from constraints: reported by unit staff on questionnaires.

*Category 3: Unit Staff Perceptions and Attitudes*  
(data reported in questionnaires completed by staff)

1. Acceptance of change: instrument developed by Patchen[21];
2. Job satisfaction: instrument by Smith, Kendall and Hulin[22];
3. Clinical orientation in present role: instrument by Hegyvary[23];
4. Clinical orientation in ideal role: instrument by Hegyvary[24];
5. Leadership behaviors: instrument by Kruse[25].

*Category 4: Supervisory Staff Perceptions and Expectations*  
(the same instruments used with unit staff)

1. Clinical role expectations in present setting;
2. Clinical role expectations in ideal setting;
3. Acceptance of change;
4. Job satisfaction;
5. Leadership behaviors.

*Category 5: Nursing Staff Education*  
(reported by hospital project staff)

1. Average RN educational level on unit;

2. Educational mix on unit: predominant type of RN preparation;
3. Education of primary nurses;
4. Education of head nurses.

A more complete description of the instruments is provided by Haussmann et al.[26]. All instruments used in this study had been previously tested for validity and reliability. The average return rate on questionnaires was 78 percent.

The dependent variable in all the analyses was the quality of the nursing process and related services, as described in Haussmann et al.[27]. This instrument defines six major components of quality:

1. Assessing and planning accomplished;
2. Physical care provided;
3. Nonphysical care provided;
4. Patient's response evaluated;
5. Unit-wide procedures performed;
6. Support services provided.

Within each of these six components, 28 discrete dimensions of the nursing process and related services are delineated. More than 300 criteria specified in detail the exact observations and sources of information for the observers in the actual data collection. A random set of the criteria was applied to a sample of approximately 20 randomly selected patients on a unit per month. The monthly quality scores thus obtained indicated the nursing performance on the unit. Scores were generated for each of the 28 dimensions as well as for the six general categories. For purposes of the investigation of correlates of quality, the six general categories of the nursing process and related services comprised the dependent variable.

Three major types of analyses were conducted to identify variables that were associated with the quality of nursing. First, the intercorrelation of the total set of independent variables was determined. Second, regression analysis showed the percent of variance explained by each individual and category of variables. Third, a quartile analysis, using t-tests, identified the differences between characteristics of the highest and lowest scoring units.

## THE FINDINGS

The first set of results was the simple correlations among the categories of independent variables. The category with the greatest association with all others was contextual variables (the characteristics of the hospital as a whole). The association was particularly strong with variables depicting unit organizational structure and supervisory staff attitudes. In turn, both unit organizational structure and supervisory staff attitudinal variables had very strong relationships with variables characterizing unit staff attitudes. Several other correlations were statistically significant, but relatively weak in comparison with the above relationships.

These correlations indicated a high degree of interrelatedness of parts of the patient care system, including both structural and attitudinal variables. These data cannot answer the question of whether a certain type of structure and environment set specific types of behaviors and attitudes, or vice versa. This query becomes very important in view of subsequent findings that several types of factors relate to nursing performance.

The second set of results came from a series of regression analyses. This type of analysis was pursued to indicate how much of the deviation in quality scores could be attributed to each single variable as well as to each category. Table 1 presents the percentage of explained variance with each category. Note that no single set shows a predominant influence. Further, no one variable in any category was all-important in the detailed regressions. The matter of identifying causative agents of high quality care is obviously complicated, spanning many elements.

Note also in Table 1 that the total set of variables provided the greatest explanation. In most parts of the nursing process, however, the unit structure and staff attitude combination supplied almost as much explanatory power. Because a major goal of the study was to delineate variables that were subject to manipulation for improving quality, the contextual variables were closely reviewed to determine whether subsequent analyses should include them.

Several contextual variables disclosed a significant relationship with components of the nursing process. In this sample of 19 hospitals, size, complexity and teaching status showed a negative relationship with the quality of the nursing process. The nongovernmental hospitals had higher quality, though findings by type (medical center, community, or county) was inconclusive. Medical school affiliation was negatively related to nursing assessment and planning, but positively associated with environmental and support services. Only two of the entire set, hospital occupancy and nursing school affiliation, had no connection with quality along any dimension of the process.

These findings contradict some evidence and much opinion about quality of care in various settings. Neuhauser and Andersen reported that the quality of medical care was positively related to size, complexity, and teaching status[28]. Since the physician ratings used in many studies as the measure of quality are subjective, conceivably the relationship may not be replicated with more objective instruments. It is possible, however, that medical and nursing care are differentially affected by contextual variables.

The results of this study indicate that one cannot state with assurance that care is better in any certain type of hospital. For our purposes in this project, we concluded that the significant contextual variables are not amenable to the control or influence of nursing management. Thus, in subsequent analyses, we chose to focus on elements at the patient care unit and staff level.

The remaining sets of variables concerned unit structure, unit and supervisory staff attitudes, leadership style, and nursing education. The category of greatest significance was unit organizational structure.

Regression analysis showed that the following variables positively influenced the quality of various components of the nursing process:

1. care organization in the direction of primary nursing;
2. extensive coordination of services;
3. characterization of leadership as strong role assumption, sensitivity, tolerance, and a minimal rigidity of structuring;
4. a high clinical orientation of unit staff in their present roles;
5. high satisfaction of unit staff;
6. acceptance of change by the supervisory staff;
7. a high clinical orientation of the supervisory staff in relation to the ideal nursing role; and
8. a high educational preparation of the unit RNs.

Five variables disclosed a negative relationship with nursing quality: size of unit, average census, LPN hours per patient day, nursing aide hours per patient day, and the level of satisfaction of the supervisory staff.

In regard to staff satisfaction some interesting cause and effect questions were raised. Unit staff were more content in the presence of excellence. Was the care better because they were happier with their job, pay, promotions, supervisors, and co-workers? Or did they have positive attitudes toward these extrinsic variables because they were participants in good practice? Contrary to the unit group, supervisory staff had *less* satisfaction in the presence of high quality care. Were their expectations still much higher, as reflected in their perceptions of the ideal nursing role? Was their dissatisfaction expressed in such a way that they effected better nursing performance on the units they supervised? Again, these are unanswered questions.

Two variables revealed inconsistencies with parts of the nursing process. RN hours per patient day showed positive relationships with nonphysical needs attended and with the quality of unit wide procedures, but negative with provision of physical care. The average workload also was negatively related with physical care; that is, when the workload was higher, physical care suffered. Workload, however, was positively related to assessing and planning and to nonphysical needs provided.

These data should not be interpreted as cause and effect information, in part because of the intercorrelation of some of the independent variables. The results are useful in identifying significant factors for further investigation in more controlled situations than were achieved in this particular effort.

To further explore the relative importance of these organ-

TABLE 2. SIGNIFICANT\* DIFFERENCES IN CHARACTERISTICS BY QUARTILES

Scale	Quality Scores	
	Lowest Quartile (N = 27)	Highest Quartile (N = 26)
<b>Unit Organizational Structure</b>		
Coordination (assessed by unit staff)†	3.03	3.23
Number of beds	38.50	27.70
Average RN hours/patient day	1.76	3.26
Average LPN hours/patient day	1.44	1.18
Average aide hours/patient day	1.63	1.05
Average census	34.42	29.79
Nursing care organization‡	2.74	3.26
<b>Leadership Style</b>		
Leadership (described by unit staff)†	13.60	14.01
<b>Unit Staff Attitudes</b>		
Clinical orientation in present role†	2.11	2.20
Satisfaction†	8.75	10.05

\*  $p < .05$ 

† Scores based on subset of quartile to which questionnaires were administered.

‡ 1 = functional nursing; 3 = team nursing; 5 = primary nursing.

NOTE: On every scale, a higher score indicates a higher level of performance.

izational and attitudinal variables in determining nursing excellence, the total set of 102 medical, surgical, and combined medical-surgical units included in the field study were divided into quartiles based on their quality scores[29]. The upper quartile (26 units) and the lower (27 units) were examined to discover whether different characteristics existed between these groups. Since questionnaires were administered to staff on only 67 units, the attitudinal data were based on a subset of the total (102) as they appeared in these two quartiles. The significant results are presented in Table 2.

As in the regression analysis, the category of greatest significance was the unit structural variables. The highest scoring groups were better coordinated, smaller, had more RN hours per patient day, fewer LPN and nurse aide hours, and were somewhat above the level of team nursing in the direction of primary nursing. The average workload indices did not vary significantly between the two sets of units; thus, the differences in staff mix are not attributable to disparate volumes of care required.

Other unit level variables did not differ between the two quartiles. Further investigation revealed that different types of units, including the typically smaller intensive care units, were represented in both quartiles. Nor were variations ascribable to type of institution—one medical center and one community hospital had units in both the highest and lowest quartiles.

The highest quality units also had more favorable unit staff attitudes. The staff reported that they had better leadership and greater job satisfaction. The clinical orientation scale also indicated that the staff performed a role that was centered more on patient and family care than on hospital operations. The two quartile groups did not differ in the clinical orientation in the "ideal role." This finding suggests that pressures in

the present role as performed on the poorer units preempted the nurse's ideals to the extent that the role is significantly different from the preferred role. It was no surprise that lower job satisfaction and a lower level of clinical performance correlate with lower total staff, a smaller ratio of professional to nonprofessional staff, a tendency toward functional assignments, and poorer coordination of services. There were no significant differences in supervisory staff attitudes in these two groups.

The results of the regression and quartile analyses of relationships at the unit level are consistent with much of the literature. They reinforced Georgopoulos's finding that the level of coordination influences the quality of nursing care, Indik's conclusions that structural elements affect job attitudes and performance, and Porter and Lawler's hypotheses that the degree of task specialization and size of the work group influence performance[30-32]. Consequently, a unit level focus is supported in investigating and making decisions about the quality of nursing care.

A difficult variable to assess in regard to its influence on quality is nursing education. A higher average educational level on the unit did show some positive relationship in the regression analysis, but not in the quartile analysis. The results regarding performance of primary nurses and head nurses were inconsistent. No particular educational category consistently performed at the highest level in the various parts of the nursing process. It should be noted that these sample sizes were small and cannot be considered representative of nurses in general.

The data do suggest that education may have an indirect or latent effect on care quality. For example, head nurses with more education had a higher level of clinical orientation. There was a strong positive correlation between high clinical